CLAIMS

What is claimed is:

1. A multi-service monitoring system comprising:

a cluster of application servers communicatively coupled on a network to serve applications over the network to a plurality of clients, each of the application servers comprising a plurality of server nodes;

an administration service to generate a plurality of runtime management beans ("MBeans") on each of the server nodes and to associate each of the runtime MBeans with specified server node resources, each of the runtime MBeans collecting and reporting monitoring data for its associated resource via an MBean server; and

a notification service to generate notifications in response to certain specified events associated with certain resources of certain MBeans, the notification service distributing the notifications across all, or a subset of, the server nodes of the cluster.

2. The system as in claim 1 further comprising:

a monitor service to generate monitor MBeans corresponding to selected runtime MBeans, the monitor MBeans arranged in a hierarchical tree structure, each of the monitor MBeans associated with at least one of the runtime MBeans, each of the monitor MBeans to receive the monitoring data from its associated runtime MBean.

3. The system as in claim 2 further comprising:

an administration adapter service include a convenience interface to provide access to one or more of the MBean servers from a remote client.

4. The system as in claim 3 wherein the administration adapter service further comprises:

a swing-based graphical user interface ("GUI") coupled to the convenience interface and the hierarchical tree structure, the swing-based GUI to represent the management functionality of the monitoring architecture to a network administrator or end user.

5. The system as in claim 3 wherein the administrator adapter service comprises a shell command interface comprising a plurality of shell commands for controlling monitor configuration data and monitor resource data.

6. The system as in claim 1 wherein the administration service generates standard runtime MBeans and specific runtime MBeans, the standard runtime MBeans providing one or more predefined standard functions for their associated resources, and the specific MBeans providing one or more resource-specific functions for their associated resources.

7. The system as in claim 6 wherein one of the standard functions comprises starting and stopping of the resource.

8. The system as in claim 6 wherein one of the standard functions comprises getting and/or setting properties associated with the resource.

9. The system as in claim 6 wherein each resource having a specific MBean associated therewith also has a standard MBean associated therewith.

10. The system as in claim 1 wherein each of the application servers comprises a plurality of server nodes and at least one dispatcher node, and wherein the administration service generate runtime MBeans on each of the server nodes and the one or more dispatcher nodes and associates each of the runtime MBeans with specified server node and/or dispatcher resources, each of the runtime MBeans collecting and reporting monitoring data for its associated resource via an MBean server.

11. The system as in claim 1 wherein one of the specified events comprises a value associated with a resource reaching a first threshold value.

12. The system as in claim 11 wherein one of the specified events comprises the value associated with the resource reaching a second threshold value, the second threshold value representing a critical resource value.

13. The system as in claim 1 wherein one of the specified events comprises a resource becoming unavailable.

14. The multi-service monitoring system as in claim 1 wherein the notification service and the administration service are Java services implemented within a Java enterprise architecture.

15. A multi-service monitoring system comprising:

a cluster of application servers communicatively coupled on a network to serve applications over the network to a plurality of clients, each of the application servers comprising a plurality of server nodes;

an administration service to generate a plurality of runtime management beans ("MBeans") on each of the server nodes and to associate each of the runtime MBeans with specified server node resources, each of the runtime MBeans collecting and reporting monitoring data for its associated resource via an MBean server; and

a monitor service to generate monitor MBeans corresponding to selected runtime MBeans, the monitor MBeans arranged in a hierarchical tree structure, each of the monitor MBeans associated with at least one of the runtime MBeans, each of the monitor MBeans to receive the monitoring data from its associated runtime MBean.

16. The system as in claim 15 further comprising:

a notification service to generate notifications in response to certain specified events associated with certain resources of certain MBeans, the notification service distributing the notifications across all, or a subset of, the server nodes of the cluster.

17. The system as in claim 15 further comprising:

an administration adapter service include a convenience interface to provide access to one or more of the MBean servers from a remote client.

18. The system as in claim 17 wherein the administration adapter service further comprises:

a swing-based graphical user interface ("GUI") coupled to the convenience interface and the hierarchical tree structure, the swing-based GUI to represent the management functionality of the monitoring architecture to a network administrator or end user.

19. The system as in claim 17 wherein the administrator adapter service comprises a shell command interface comprising a plurality of shell commands for controlling monitor configuration data and monitor resource data.

20. The system as in claim 15 wherein the administration service generates standard runtime MBeans and specific runtime MBeans, the standard runtime MBeans providing one or more predefined standard functions for their associated resources, and the specific MBeans providing one or more resource-specific functions for their associated resources.

21. The system as in claim 20 wherein one of the standard functions comprises starting and stopping of the resource.

22. The system as in claim 20 wherein one of the standard functions comprises getting and/or setting properties associated with the resource.

23. The system as in claim 20 wherein each resource having a specific MBean associated therewith also has a standard MBean associated therewith.

24. The system as in claim 15 wherein each of the application servers comprises a plurality of server nodes and at least one dispatcher node, and wherein the administration service generate runtime MBeans on each of the

server nodes and the one or more dispatcher nodes and associates each of the runtime MBeans with specified server node and/or dispatcher resources, each of the runtime MBeans collecting and reporting monitoring data for its associated resource via an MBean server.

25. The system as in claim 15 wherein one of the specified events comprises a value associated with a resource reaching a first threshold value.

26. The system as in claim 25 wherein one of the specified events comprises the value associated with the resource reaching a second threshold value, the second threshold value representing a critical resource value.

27. The system as in claim 15 wherein one of the specified events comprises a resource becoming unavailable.

28. A system comprising:

application server means comprising a cluster of application servers communicatively coupled on a network to serve applications over the network to a plurality of clients, each of the application servers comprising a plurality of server nodes;

administration service means to generate a plurality of runtime management beans ("MBeans") on each of the server nodes and to associate each of the runtime MBeans with specified server node resources, each of the runtime MBeans collecting and reporting monitoring data for its associated resource via an MBean server; and

notification service means to generate notifications in response to certain specified events associated with certain resources of certain MBeans, the

notification service means distributing the notifications across all, or a subset of, the server nodes of the cluster.

29. The system as in claim 28 further comprising:

monitor service means to generate monitor MBeans corresponding to selected runtime MBeans, the monitor MBeans arranged in a hierarchical tree structure, each of the monitor MBeans associated with at least one of the runtime MBeans, each of the monitor MBeans to receive the monitoring data from its associated runtime MBean.